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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/563,373

01/04/2006

Isamu Nakao

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EXAMINER

MA, JAMESON Q

ART UNIT

PAPER NUMBER

1797

MAIL DATE

DELIVERY MODE

11/23/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/563,373	Applicant(s) NAKAO ET AL.	
	Examiner JAMESON Q. MA	Art Unit 1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 July 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3 and 5-17 is/are pending in the application.
- 4a) Of the above claim(s) 6-17 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 5 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>20090709</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
2. Claims 1-3 are rejected under 35 U.S.C. 102(b) as being anticipated by Ootsubo et al. (US 2003/0087297).

Regarding claim 1, Ootsubo discloses a biochemical reaction apparatus comprising a means for holding a substrate having a reaction area for biochemical reaction (see fig. 5: glass substrate 31, which is equivalent to quartz glass as described in the instant specification) and an electrode formed in the reaction area (see fig. 5 and [0028]: metal layer 32 is a positive electrode); an external electrode disposed opposite to the electrode of the substrate (see fig. 4: negative electrode 13 is viewed as having a probe shape); and an electric field controlling means for generating an electric field between the electrode of the substrate and external electrode (voltage source 14).

Regarding claim 2, Ootsubo discloses the apparatus wherein the electrode of the substrate is a conductive layer formed as an underlying layer of the reaction area; and the external electrode has a plane parallel to the conductive layer

Regarding claim 3, Ootsubo discloses the apparatus wherein the electric field controlling means generates an AC electric field between the substrate electrode and external electrode (see [0037]).

3. Claims 1-2 are rejected under 35 U.S.C. 102(b) as being anticipated by Hashimoto (US 2001/0024788).

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Regarding claim 1, Hashimoto discloses a biochemical reaction apparatus comprising a means for holding a substrate having a reaction area for biochemical reaction (see [0024], Hashimoto discloses that quartz glass, polyethylene, and polystyrene can be used as substrate materials, which are the same materials disclosed by the instant specification) and an electrode formed in the reaction area (see fig. 2, composite electrode 8); an external electrode disposed opposite to the electrode of the substrate (see fig. 2: composite electrode 4 which is viewed as having a probe shape); and an electric field controlling means for generating an electric field between the electrode of the substrate and external electrode (see [0064], a potential of 500 mV was applied, which would require an electric field controlling means).

Regarding claim 2, Hashimoto discloses the apparatus wherein the electrode of the substrate is a conductive layer formed as an underlying layer of the reaction area; and the external electrode has a plane parallel to the conductive layer

Claim Rejections - 35 USC § 103

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hashimoto (US 2001/0024788) in view of Phan (US 5,434,423) and Wheatley (US 4,313,971).

Regarding claim 5, Hashimoto discloses all of the claim limitations as set forth above. Additionally, Hashimoto discloses that the electrodes can be made of a

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semiconductor material (see [0025]). Hashimoto further discloses that positive and negative electrodes are used (see fig. 2).

Hashimoto fails to disclose the apparatus wherein an electrode is formed from a semiconductor wafer having acceptor or donor ions doped therein.

Phan teaches that it is well known that semiconductors are altered in electrical behavior by the introduction of dopants. Than further discloses that dopants generally come as either n-type or p-type.

It would have been obvious to one of ordinary skill in the art at the time of invention to select an n-type or p-type as the negative and positive electrodes in the apparatus of Hashimoto, because doing so would have resulted in nothing more than choosing from a finite number of identified, predictable solutions of semiconductors capable of acting as either a negative or positive electrode, as set forth by Hashimoto, with a reasonable expectation of success.

Wheatley discloses that a Schottky barrier contact has the advantage that its forward voltage drop is controllable by the selection of the metal used in forming it and that a Schottky barrier contact or diode is formed when an appropriate metal is deposited on a semiconductor material having a dopant concentration below a threshold concentration above which a desired Schottky barrier cannot be formed (see C1/L10-33). Wheatley further discloses that the semiconductor should be in wafer form (see C1/L18-22).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify the semiconductor of modified Hashimoto to be in wafer form and to

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incorporate a Schottky barrier contact so that forward voltage drop could be controlled simply by the selection of metal to allow for improved precision and control in the substrate's intended processes and applications.

Response to Arguments

6. Applicant's arguments filed 7/9/2009 have been fully considered but they are not persuasive. Applicant asserts that both Ootsubo and Hashimoto disclose flat electrodes and not electrodes that have a probe shape. In response, it is noted that while the electrodes of the prior art references may be generally 'flat,' they inherently have a three-dimensional volume, and are thus viewed to be sufficiently 'probe-shaped.'

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to JAMESON Q. MA whose telephone number is (571)270-7063. The examiner can normally be reached on M-F 8:30 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Marcheschi can be reached on (571)272-1374. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JM
November 19, 2009

/Michael A Marcheschi/
Supervisory Patent Examiner, Art
Unit 1797